

AMENDMENT(S) TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in this application:

Listing of Claims:

1. (Previously presented) A composition comprising a mixture of racemic and meso isomers of metallocene compounds having the formula:

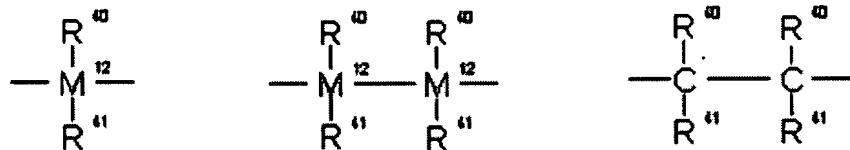
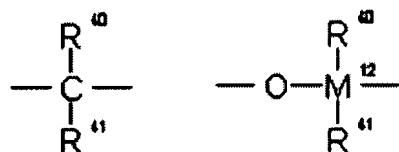


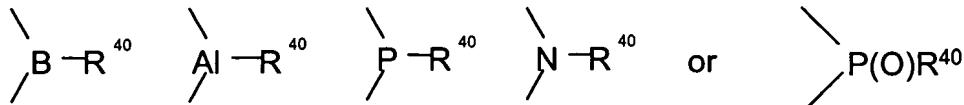
where L^1 and L^2 are identical or different ligands and are each a substituted mononuclear or polynuclear hydrocarbon radical selected from the group consisting of substituted cyclopentadienyl, indenyl, tetrahydroindenyl, azurenyl, fluorenyl, azapentalenyl, thiapentalenyl or oxapentalenyl, which form a sandwich structure with atom M^1 therebetween,

R^1 and R^2 are identical or different and are each a hydrogen atom, an alkyl group of from 1 to about 10 carbon atoms, an alkoxy group of from 1 to about 10 carbon atoms, an aryl group of from 6 to about 20 carbon atoms, an aryloxy group of from about 6 to about 10 carbon atoms, an alkenyl group of from 2 to about 10 carbon atoms, an OH group, a halogen atom, or a NR_2^{32} group, where R^{32} is an alkyl group of from 1 to about 10 carbon atoms or an aryl group of from 6 to about 14 carbon atoms, or R^1 and R^2 form one or more ring system(s),

M^1 is a metal of group IVb of the Periodic Table of the Elements,

R^9 is a bridge between the ligands L^1 and L^2 having one of the structures:





where R^{40} and R^{41} , are identical or different, with or without heteroatoms, when R^{40} and R^{41} are identical they are selected from the group consisting of a cyclic or non-cyclic alkyl group having from 2 to about 30 carbon atoms, a fluoroalkyl group of from 2 to about 10 carbon atoms, an alkoxy group of from 2 to about 10 carbon atoms, an aryloxy group of from 6 to about 10 carbon atoms, an alkenyl group of from about 3 to about 10 carbon atoms, an arylalkyl group of from 7 to about 40 carbon atoms, an alkylaryl group of from 7 to about 40 carbon atoms, a substituted or unsubstituted alkylsilyl or arylsilyl group and an arylalkenyl group of from 8 to about 40 carbon atoms, when R^{40} and R^{41} are different one of either R^{40} and R^{41} is selected from the group consisting of a cyclic or non-cyclic alkyl group having from 4 to about 40 carbon atoms, a fluoroalkyl group of from 2 to about 10 carbon atoms, an alkoxy group of from 2 to about 10 carbon atoms, an aryloxy group of from 6 to about 10 carbon atoms, an alkenyl group of from 3 to about 10 carbon atoms, an arylalkyl group of from 7 to about 40 carbon atoms, an alkylaryl group of from 7 to about 40 carbon atoms, a substituted or unsubstituted alkylsilyl or arylsilyl group and an arylalkenyl group of from 8 to about 40 carbon atoms, and the other of R^{40} and R^{41} is selected from the group consisting of a cyclic or non-cyclic alkyl group having from 1 to 40 carbon atoms, a fluoroalkyl group of from 2 to about 10 carbon atoms, an alkoxy group of from 2 to about 10 carbon atoms an aryloxy group of from 6 to about 10 carbon atoms, an alkenyl group of from 3 to about 10 carbon atoms, an arylalkyl group of from 7 to about 40 carbon atoms, an alkylaryl group of from 7 to about 40 carbon atoms, a substituted or unsubstituted alkylsilyl or arylsilyl group and an arylalkenyl group of from 8 to about 40 carbon atoms,

M^{12} is silicon, germanium or tin, and

wherein the mixture of racemic and meso isomers as synthesized has a weight ratio of racemic to meso isomers of greater than 5:1.

2. (Original) The composition of Claim 1 wherein L¹ is a substituted cyclopentadienyl, indenyl, tetrahydroindenyl, azurenyl, fluorenyl, azapentalenyl, thiapentalenyl or oxapentalenyl,

L² is a substituted indenyl, tetrahydroindenyl, azurenyl, fluorenyl, azapentalenyl, thiapentalenyl or oxapentalenyl, and

the bridging unit R⁹ is R⁴⁰R⁴¹Si=, R⁴⁰R⁴¹Ge=, R⁴⁰ R⁴¹C= or -(R⁴⁰R⁴¹C-CR⁴⁰R⁴¹)-, where R⁴⁰ and R⁴¹ are identical or different and are each an alkyl group of from 2 to about 30 carbon atoms, an arylalkyl group of from 7 to about 14 carbon atoms or an alkylaryl group of from 7 to about 14 carbon atoms.

3. (Currently amended) The composition of Claim 1 wherein R⁴⁰ and R⁴¹ are different, R⁴⁰ is a C₄-C₃₀ hydrocarbon cyclic or non-cyclic alkyl group and R⁴¹ is a C₁-C₃₀ hydrocarbon cyclic or non-cyclic alkyl group.

4. (Currently amended) The composition of Claim 1 wherein L¹ and L² are identical or different and are each a substituted indenyl, azurenyl, fluorenyl, azapentalenyl, thiapentalenyl or oxapentalenyl, and

the bridging unit R⁹ is R⁴⁰R⁴¹Si= or R⁴⁰R⁴¹Ge=, where R⁴⁰ and R⁴¹ are identical or different and are propyl, butyl, pentyl, hexyl, heptyl, octyl, nonyl, decyl, undecyl, dodecyl, cyclopentyl, or cyclohexyl.

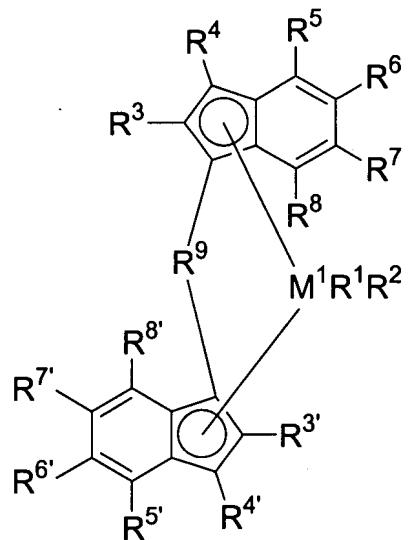
5. (Currently amended) The composition of Claim 4 wherein R⁴⁰ and R⁴¹ are different, R⁴⁰ is butyl, pentyl, hexyl, heptyl, octyl, nonyl, decyl, undecyl, dodecyl, cyclopentyl, cyclopentadienyl, or cyclohexyl, and R⁴¹ is methyl, ethyl, propyl, butyl, pentyl, hexyl, heptyl, octyl, nonyl, decyl, undecyl, dodecyl, cyclopentyl, or cyclohexyl.

6. (Original) The composition of Claim 1 wherein the weight ratio of racemic to meso isomers is greater than 10:1.

7. (Original) The composition of Claim 1 wherein the weight ratio of racemic to meso isomer is greater than 15:1.

8. (Original) The composition of Claim 1 wherein the weight ratio of racemic to meso isomers is greater than 20:1.

9. (Currently amended) The composition of Claim 1 wherein the compound has the formula:



(formula 1b)

where R^3 , R^4 , R^5 , R^6 , R^7 , R^8 and also $R^{3'}$, $R^{4'}$, $R^{5'}$, $R^{6'}$, $R^{7'}$ and $R^{8'}$ are identical or different and are each a hydrogen atom or a linear, cyclic or branched group, with or without heteroatoms, selected from an alkyl group of from 1 to about 10 carbon atoms, an alkenyl group of from 2 to about 10 carbon atoms, an aryl group of from 6 to about 20 carbon atoms, an arylalkyl group of from 7 to about 40 carbon atoms, an alkylaryl group of from 7 to about 40 carbon atoms or an arylalkenyl group of from 8 to about 40 carbon atoms, or a substituted or unsubstituted alkylsilyl or arylsilyl group, with the proviso that R^3 and $R^{3'}$ are not hydrogen, and wherein two adjacent

radicals R⁵, R⁶ or R^{5'}, R^{6'}, or R⁶, R⁷ or R^{6'}, R^{7'}, or R⁷, R⁸ or R^{7'}, R^{8'} can form a hydrocarbon ring system.

10. (Original) The composition of Claim 9 wherein at least one of R³, R⁴, R⁵, R⁶, R⁷, R⁸, R^{3'}, R^{4'}, R^{5'}, R^{6'}, R^{7'} and R^{8'} includes a heteroatom selected from the group consisting of Si, B, Al, O, S, N, P, F, Cl and Br.

11. (Original) The composition of Claim 9 where

M¹ is zirconium or hafnium,

R¹ and R² are identical or different and are an alkyl group of from 1 to about 10 carbon atoms, an alkoxy group of from 1 to about 10 carbon atoms, an aryloxy group of from 6 to about 10 carbon atoms, or a halogen atom, or R¹ and R² together form one or more ring system(s),

R³ and R^{3'}, are identical or different and are each a linear, cyclic or branched group, with or without a halogen, selected from the group consisting of an alkyl group of from 1 to about 10 carbon atoms and an alkenyl group of from 2 to about 10 carbon atoms,

R⁴, R⁵, R⁶, R⁷, R⁸ and also R^{4'}, R^{5'}, R^{6'}, R^{7'} and R^{8'} are identical or different and are each a hydrogen atom, or a substituted or unsubstituted alkylsilyl or arylsilyl group, or a linear, cyclic or branched group, with or without heteroatoms, or an alkyl group of from 1 to about 10 carbon atoms, an aryl group of from 6 to about 10 carbon atoms, or the two adjacent radicals R⁵, R⁶ and R^{5'}, R^{6'} may form a hydrocarbon ring system,

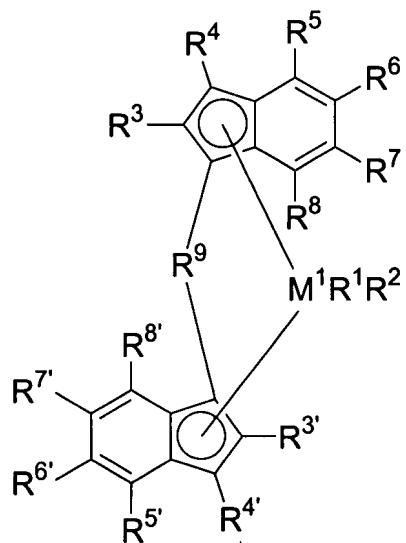
R⁹ is R⁴⁰R⁴¹Si=, R⁴⁰R⁴¹Ge=, R⁴⁰ R⁴¹C= or -(R⁴⁰R⁴¹C-CR⁴⁰R⁴¹)-, where R⁴⁰ and R⁴¹ are identical or different and are each an alkyl group of from 2 to about 30 carbon atoms, an arylalkyl group of from 7 to about 14 carbon atoms or an alkylaryl group of from 7 to about 14 carbon atoms.

12. (Currently amended) The composition of Claim 9 wherein R⁴⁰ and R⁴¹ are different, R⁴⁰ is a hydrocarbon an alkyl group of from 4 to about 30 carbon atoms, and R⁴¹ is a hydrocarbon an alkyl group of from 1 to about 30 carbon atoms.

13. (Currently amended) The composition of Claim 9 wherein
M¹ is zirconium,
R¹ and R² are identical or different and are methyl, chlorine or phenolate,
R³ and R^{3'}, are identical or different and are each a linear, cyclic or branched group, with
or without a halogen, which is and are selected from the group consisting of an alkyl group of
from 1 to about 10 carbon atoms and an alkenyl group of from 2 to about 10 carbon atoms,
R⁴ and ~~also~~ R^{4'} are hydrogen,
R⁵, R⁶, R⁷, R⁸ and ~~also~~ R^{5'}, R^{6'}, R^{7'}, R^{8'} are identical or different and are each a hydrogen
atom or a linear, cyclic or branched alkyl group of from 1 to about 10 carbon atoms, or an aryl
group of from 6 to about 10 carbon atoms, or the two adjacent radicals R⁵, R⁶ and R^{5'}, R^{6'} form a
hydrocarbon ring system, and
R⁹ is R⁴⁰R⁴¹Si= or R⁴⁰R⁴¹Ge=, where R⁴⁰ and R⁴¹ are identical or different and are propyl,
butyl, pentyl, hexyl, heptyl, octyl, nonyl, decyl, undecyl, dodecyl, cyclopentyl, ~~cyclopentadienyl~~
or cyclohexyl.

14. (Currently amended) The composition of Claim 13 wherein R⁴⁰ and R⁴¹ are
different and R⁴⁰ is butyl, pentyl, hexyl, heptyl, octyl, nonyl, decyl, undecyl, dodecyl,
cyclopentyl, ~~cyclopentadienyl~~ or cyclohexyl and R⁴¹ is methyl, ethyl, propyl, butyl, pentyl,
hexyl, heptyl, octyl, nonyl, decyl, undecyl, dodecyl, cyclopentyl, ~~cyclopentadienyl~~ or cyclohexyl.

15. (Currently amended) The composition of Claim 1 wherein the compound has the
formula:



(formula 1c)

where R^3 , R^4 , R^5 , R^6 , R^7 , R^8 and also $R^{3'}$, $R^{4'}$, $R^{5'}$, $R^{6'}$, $R^{7'}$ and $R^{8'}$ are identical or different and are each a hydrogen atom, or a linear, cyclic or branched hydrocarbon group with or without heteroatoms and selected from an alkyl group of from 1 to about 10 carbon atoms, an alkenyl group of from 2 to about 10 carbon atoms, an aryl group of from 6 to about 20 carbon atoms, an arylalkyl group of from 7 to about 40 carbon atoms, an alkylaryl group of from 7 to about 40 carbon atoms or an arylalkenyl group of from 8 to about 40 carbon atoms, or a substituted or unsubstituted alkylsilyl or arylsilyl group, with the proviso that R^3 and $R^{3'}$ are not hydrogen and that R^5 and $R^{5'}$ are identical or different and are each a substituted or unsubstituted aryl group of from 6 to about 40 20 carbon atoms.

16. (Original) The composition of Claim 15 wherein at least one of R^3 , R^4 , R^5 , R^6 , R^7 , R^8 , $R^{3'}$, $R^{4'}$, $R^{5'}$, $R^{6'}$, $R^{7'}$ and $R^{8'}$ includes a heteroatom selected from the group consisting of Si, B, Al, O, S, N, P, F, Cl and Br.

17. (Currently amended) The composition of Claim 15 wherein M^1 is zirconium or hafnium,

R^1 and R^2 are identical or different and are an alkyl group of from 1 to about 10 carbon atoms, an alkoxy group of from 1 to about 10 carbon atoms, an aryloxy group of from 6 to about 10 carbon atoms or a halogen atom, or R^1 and R^2 together form one or more ring system(s), and

R^3 and $R^{3'}$, are identical or different and are each a linear, cyclic or branched group, with or without a halogen, and selected from the group consisting of an alkyl group of from 1 to about 10 carbon atoms and an alkenyl group of 2 to about 10 carbon atoms, and

R^4 , R^6 , R^7 , R^8 and also $R^{4'}$, $R^{6'}$, $R^{7'}$ and $R^{8'}$ are identical or different and are each a hydrogen atom or a linear, cyclic or branched alkyl group of from 1 to about 10 carbon atoms, with or without a heteroatom,

R^5 and $R^{5'}$ are identical or different and are each a substituted aryl group of from 6 to ~~about 40~~ 20 carbon atoms,

R^9 is $R^{40}R^{41}Si=$, $R^{40}R^{41}Ge=$, $R^{40}R^{41}C=$ or $-(R^{40}R^{41}C-CR^{40}R^{41})-$, where R^{40} and R^{41} are identical or different and are each an alkyl group of from 2 to about 30 carbon atoms, an arylalkyl group of from 7 to about 14 carbon atoms or an alkylaryl group of from 7 to about 14 carbon atoms.

18. (Currently amended) The composition of Claim 15 wherein R^{40} and R^{41} are different, R^{40} is a hydrocarbon a cyclic or non-cyclic alkyl group of from 4 to about 30 carbon atoms and R^{41} is a hydrocarbon a cyclic or non-cyclic alkyl group of from 1 to about 30 carbon atoms.

19. (Currently amended) The composition of Claim 15 wherein M^1 is zirconium, R^1 and R^2 are identical or different and are an alkyl group of from 1 to about 10 carbon atoms, an alkoxy group of from 1 to about 10 carbon atoms, an aryloxy group of from 6 to about 10 carbon atoms or a halogen atom, or R^1 and R^2 together form one or more ring system(s),

R^3 and $R^{3'}$ are identical or different and are each a linear, cyclic or branched methyl, ethyl, propyl, butyl, pentyl or hexyl,

R^4 and $R^{4'}$ are both hydrogen,

R^6 , R^7 , R^8 and also $R^{6'}$, $R^{7'}$ and $R^{8'}$ are identical or different and are each a hydrogen atom or a linear, cyclic or branched alkyl group of from 1 to about 10 carbon atoms, with or without a heteroatom,

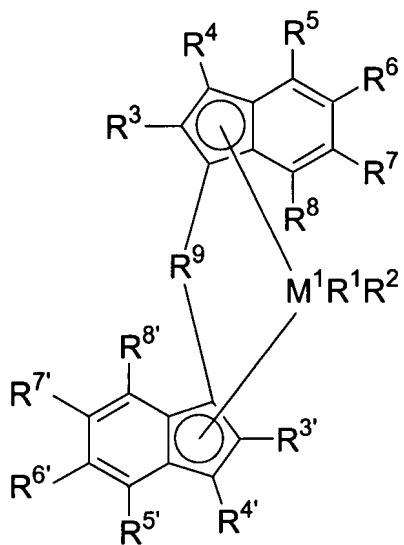
R^5 and $R^{5'}$ are identical or different and are naphthyl, para-(C_1 - C_{10} -alkyl)phenyl, para-(C_1 - C_{10} -fluoroalkyl)phenyl, meta-(C_1 - C_{10} -alkyl)phenyl, meta-(C_1 - C_{10} -alkyl)phenyl, meta, meta'-(C_1 - C_{10} -alkyl)₂phenyl or meta, meta'-(C_1 - C_{10} -fluoroalkyl)₂phenyl, and

R^9 is $R^{40}R^{41}Si=$ or $R^{40}R^{41}Ge=$, where R^{40} and R^{41} are identical or different and are ~~propyl, butyl, pentyl, hexyl, heptyl, octyl, nonyl, decyl, undecyl, dodecyl, cyclo pentyl, or cyclohexyl.~~

20. (Original) The composition of Claim 19 wherein R^1 and R^2 are identical and are methyl, chlorine, or phenolate.

21. (Currently amended) The composition of Claim 19 wherein R^{40} and R^{41} are different and R^{40} is butyl, pentyl, hexyl, heptyl, octyl, nonyl, decyl, undecyl, dodecyl, cyclopentyl, ~~cyclopentadienyl~~ or cyclohexyl, and R^{41} is methyl, ethyl, propyl, butyl, pentyl, hexyl, heptyl, octyl, nonyl, decyl, undecyl, dodecyl, cyclopentyl, or cyclohexyl.

22. (Original) The composition of Claim 1 wherein the compound has the formula:



(formula 1d)

where R⁴, R⁵, R⁶, R⁷, R⁸ and also R^{4'}, R^{5'}, R^{6'}, R^{7'} and R^{8'} are identical or different and are each a hydrogen atom, a linear, cyclic or branched hydrocarbon group, with or without heteroatoms, and selected from the group consisting of an alkyl group of from 1 to about 10 carbon atoms, an alkenyl group of from 2 to about 10 carbon atoms, an aryl group of from 6 to about 20 carbon atoms, an arylalkyl group of from 7 to about 40 carbon atoms, an alkylaryl group of from 7 to about 40 carbon atoms or an arylalkenyl group of from 8 to about 40 carbon atoms, or a substituted or unsubstituted alkylsilyl or arylsilyl group, with the proviso that R⁵ and R^{5'} are identical or different and are each a substituted aryl group of from 6 to about 40 carbon atoms,

R³ is a linear hydrocarbon group, with or without a heteroatom, and selected from the group consisting of an alkyl group of from 1 to about 20 carbon atoms, an aryl substituted alkyl group of from 7 to about 40 carbon atoms and an aryl substituted alkenyl group of from 8 to about 40 carbon atoms,

R^{3'} is a hydrocarbon group, cyclic or branched in the α position, with or without a heteroatom, and selected from the group consisting of an alkyl group of from 3 to about 20 carbon atoms, an alkenyl group of from 3 to about 20 carbon atoms, an aryl group of from 6 to about 20 carbon atoms, an arylalkyl group of from 7 to about 40 carbon atoms, an alkylaryl

group of from 7 to about 40 carbon atoms and an arylalkenyl group of from 8 to about 40 carbon atoms.

23. (Currently amended) The composition of Claim 22 wherein M¹ is zirconium or hafnium,

R¹ and R² are identical or different and are an alkyl group of from 1 to about 10 carbon atoms, an alkoxy group of from 1 to about 10 carbon atoms, an aryloxy group of from 6 to about 10 carbon atoms or a halogen atom, or R¹ and R² together form one or more ring system(s),

R³ is a linear alkyl group of from 1 to about 10 carbon atoms or an alkenyl group of from 2 to about 10 carbon atoms, with or without a halogen,

R³ is a hydrocarbon group, cyclic or branched in the α position and selected from the group consisting of an alkyl group of from 3 to about 20 carbon atoms and cyclic or branched in the α position, an alkenyl group of from 3 to about 20 carbon atoms, or an alkylaryl group of from 7 to about 20 carbon atoms,

R⁴, R⁶, R⁷, R⁸ and also R^{4'}, R^{6'}, R^{7'} and R^{8'} are identical or different and are each a hydrogen atom or a linear, cyclic or branched alkyl group of from 1 to about 20 10 carbon atoms, with or without a halogen,

R⁵ and R^{5'} are identical or different and are each a substituted aryl group of from 6 to about 40 carbon atoms, selected from para-(C₁-C₁₀-alkyl)phenyl, meta-(C₁-C₁₀-alkyl)phenyl, meta'-(C₁-C₁₀-alkyl)₂phenyl, and

R⁹ is R⁴⁰R⁴¹Si=, R⁴⁰R⁴¹Ge=, R⁴⁰R⁴¹C= or -(R⁴⁰R⁴¹C-CR⁴⁰R⁴¹)-, where R⁴⁰ and R⁴¹ are identical or different and are each an alkyl group of from 2 to about 30 carbon atoms, an arylalkyl group of from 7 to about 14 carbon atoms or an alkylaryl group of from 7 to about 14 carbon atoms.

24. (Currently amended) The composition of Claim 22 wherein R⁴⁰ and R⁴¹ are different, R⁴⁰ is a hydrocarbon a cyclic or non-cyclic alkyl group of from 4 to about 30 carbon atoms and R⁴¹ is a hydrocarbon a cyclic or non-cyclic alkyl group of from 1 to about 30 carbon

atoms.

25. (Currently amended) The composition of Claim 22 where M¹ is zirconium, R¹ and R² are identical and are methyl, chlorine, or phenolate, R³ is methyl, ethyl, n-propyl, n-butyl, n-pentyl or n-hexyl, R^{3'} is iso-propyl, ~~iso-butyl~~, sec-butyl, cyclobutyl, 1-methyl-butyl, 1-ethyl-butyl, 1-methyl-pentyl, cyclopentyl, cyclohexyl, cyclopent-2-enyl, cyclopent-3-enyl, cyclohex-2-enyl, cyclohex-3-enyl or para-methyl-cyclohexyl,

R⁴ and also R^{4'} are hydrogen, and

R⁶, R⁷, R⁸ and also R^{6'}, R^{7'} and R^{8'} are identical or different and are each a hydrogen atom or a linear, cyclic or branched alkyl group of from 1 to about 10 carbon atoms, with or without a heteroatom, and,

R⁵ and R^{5'} are identical or different and are p-isopropyl-phenyl, p-tert[[.]]-butyl-phenyl, p-s-butyl-phenyl, p-cyclohexyl-phenyl, p-trimethylsilyl-phenyl, p-adamantyl-phenyl, ~~p-(trifluorotrimethylphenyl p-(trifluoro)trimethyl-phenyl, m,m'-dimethyl-phenyl, and~~

~~R⁹ is R⁴⁰R⁴¹Si= or R⁴⁰R⁴¹Ge=, where R⁴⁰ and R⁴¹ are identical or different and are propyl, butyl, pentyl, hexyl, heptyl, octyl, nonyl, decyl, undecyl, dodecyl, cyclo-pentyl, or cyclohexyl.~~

26. (Currently amended) The composition of Claim 25 wherein R⁴⁰ and R⁴¹ are different and R⁴⁰ is butyl, pentyl, hexyl, heptyl, octyl, nonyl, decyl, undecyl, dodecyl, cyclopentyl, ~~cyclopentadienyl~~ or cyclohexyl, and R⁴¹ is methyl, ethyl, propyl, butyl, pentyl, hexyl, heptyl, octyl, nonyl, decyl, undecyl, dodecyl, cyclopentyl, or cyclohexyl.

27. (Currently amended) The composition of Claim 1 wherein the synthesized compound is selected from the group consisting of:

A-(2-isopropyl-4-(p-isopropyl-phenyl)indenyl)(2-methyl-4-(p-isopropyl-phenyl) indenyl)-zirconiumdichloride,

A-(2-isopropyl-4-(p-tert-butyl-phenyl)indenyl)(2-methyl-4-(p-tert-butyl-phenyl) indenyl)-zirconiumdichloride,

A-(2-isopropyl-4-(p-tert-butyl-phenyl)indenyl)(2-methyl-4-(p-tert-butyl-phenyl) indenyl)-zirconiumdichloride,

A-(2-isopropyl-4-(p-tert-butyl-phenyl)indenyl)(2,7-dimethyl-4-(p-tert-butyl-phenyl) indenyl)-zirconiumdichloride,

A-(2-isopropyl-4-(p-tert-butyl-phenyl)indenyl)(2,7-dimethyl-4-(p-tert-butyl-phenyl) indenyl)-zirconiumdichloride,

A-(2-isopropyl-4-(p-tert-butyl-phenyl)indenyl)(2,5,6,7-tetramethyl-4-(p-tert-butyl-phenyl)indenyl)-zirconiumdichloride,

A-(2-isopropyl-4-(p-tert-butyl-phenyl)indenyl)(2,5,6,7-tetramethyl-4-(p-tert-butyl-phenyl)indenyl)-zirconiumdichloride,

A-(2-isopropyl-6-methyl-4-(p-tert-butyl-phenyl)indenyl)(2,6-dimethyl-4-(p-tert-butyl-phenyl)indenyl)-zirconiumdichloride,

A-(2-isopropyl-6-methyl-4-(p-tert-butyl-phenyl)indenyl)(2,6-dimethyl-4-(p-tert-butyl-phenyl)indenyl)-zirconiumdichloride,

A-(2-isopropyl-4-(p-sec-butyl-phenyl)indenyl)(2-methyl-4-(p-sec-butyl-phenyl) indenyl)-zirconiumdichloride,

A-(2-isopropyl-4-(p-sec-butyl-phenyl)indenyl)(2-methyl-4-(p-sec-butyl-phenyl) indenyl)-zirconiumdichloride,

A-(2-isopropyl-4-(p-cyclohexyl-phenyl)indenyl)(2-methyl-4-(p-cyclohexyl-phenyl) indenyl)-zirconiumdichloride,

A-(2-isopropyl-4-(p-trimethylsilyl-phenyl)indenyl)(2-methyl-4-(p-trimethylsilyl-phenyl)indenyl)-zirconiumdichloride,

A-(2-isopropyl-4-(p-adamantyl-phenyl)indenyl)(2-methyl-4-(p-adamantyl-phenyl)indenyl)-zirconiumdichloride,

A-(2-isopropyl-4-(p-tris(trifluoromethyl)methyl-phenyl)indenyl)(2-methyl-4-(p-tris(trifluoromethyl)methyl-phenyl)indenyl)-zirconiumdichloride,

~~A-(2-isopropyl-4-phenyl-indenyl)(2-methyl-4-(p-tert-butyl-phenyl)indenyl)-zirconiumdichloride;~~

A-(2-isopropyl-4-phenyl-indenyl)(2-methyl-4-(p-tert-butyl-phenyl)indenyl)-zirconiumdichloride;

~~A-(2-isopropyl-4-(p-tert-butyl-phenyl)indenyl)(2-methyl-4-phenyl-indenyl)-zirconiumdichloride;~~

A-(2-isopropyl-4-(p-tert-butyl-phenyl)indenyl)(2-methyl-4-phenyl-indenyl)-zirconiumdichloride,

~~A-(2-isopropyl-4-(p-tert-butyl-phenyl)indenyl)(2,7-dimethyl-4-phenyl-indenyl)-zirconiumdichloride;~~

A-(2-isopropyl-4-(p-tert-butyl-phenyl)indenyl)(2,7-dimethyl-4-phenyl-indenyl)-zirconiumdichloride,

~~A-(2-isopropyl-4-(p-tert-butyl-phenyl)indenyl)(2,5,6,7-tetramethyl-4-phenyl-indenyl)-zirconiumdichloride;~~

A-(2-isopropyl-4-(p-tert-butyl-phenyl)indenyl)(2,5,6,7-tetramethyl-4-phenyl-indenyl)-zirconiumdichloride,

~~A-(2-isopropyl-6-methyl-4-(p-tert-butyl-phenyl)indenyl)(2,6-dimethyl-4-phenyl-indenyl)-zirconiumdichloride;~~

A-(2-isopropyl-6-methyl-4-(p-tert-butyl-phenyl)indenyl)(2,6-dimethyl-4-phenyl-indenyl)-zirconiumdichloride,

~~A-(2-isopropyl-4-phenyl-indenyl)(2,7-dimethyl-4-(p-tert-butyl-phenyl)indenyl)-zirconiumdichloride;~~

A-(2-isopropyl-4-phenyl-indenyl)(2,7-dimethyl-4-(p-tert-butyl-phenyl)indenyl)-zirconiumdichloride,

~~A-(2-isopropyl-4-phenyl-indenyl)(2,5,6,7-tetramethyl-4-(p-tert-butyl-phenyl)indenyl)-zirconiumdichloride;~~

A-(2-isopropyl-4-phenyl-indenyl)(2,5,6,7-tetramethyl-4-(p-tert-butyl-phenyl)indenyl)-zirconiumdichloride,

A-(2-isopropyl-6-methyl-4-phenyl-indenyl)(2,6-dimethyl-4-(p-tert-butyl-phenyl)-indenyl)-zirconiumdichloride,

A-(2-isopropyl-6-methyl-4-phenyl-indenyl)(2,6-dimethyl-4-(p-tert-butyl-phenyl)-indenyl)-zirconiumdichloride,

A-(2-isopropyl-4-(p-tert-butyl-phenyl)-indenyl)(2-methyl-4-(4-naphthyl)-indenyl)-zirconiumdichloride,

A-(2-isopropyl-4-(p-tert-butyl-phenyl)-indenyl)(2-methyl-4-(4-naphthyl)-indenyl)-zirconiumdichloride,

A-(2-isopropyl-4-(4-naphthyl)-indenyl)(2-methyl-4-(p-tert-butyl-phenyl)-indenyl)-zirconiumdichloride,

A-(2-isopropyl-4-(4-naphthyl)-indenyl)(2-methyl-4-(p-tert-butyl-phenyl)-indenyl)-zirconiumdichloride,

A-bis(4-naphthyl-indenyl)zirconiumdichloride,

A-bis(2-methyl-benzo-indenyl)zirconiumdichloride

A-bis(2-methyl-indenyl)zirconiumdichloride,

A-bis(2-methyl-4-(1-naphthyl)-indenyl)zirconiumdichloride,

A-bis(2-methyl-4-(2-naphthyl)-indenyl)zirconiumdichloride,

A-bis(2-methyl-4-phenyl-indenyl)zirconiumdichloride,

A-bis(2-methyl-4-t-butyl-indenyl)zirconiumdichloride,

A-bis(2-methyl-4-isopropyl-indenyl)zirconiumdichloride,

A-bis(2-methyl-4-ethyl-indenyl)zirconiumdichloride,

A-bis(2-methyl-4-acenaphth-indenyl)zirconiumdichloride,

A-bis(2,4-dimethyl-indenyl)zirconiumdichloride,

A-bis(2-ethyl-indenyl)zirconiumdichloride,

A-bis(2-ethyl-4-ethyl-indenyl)zirconiumdichloride,

A-bis(2-ethyl-4-phenyl-indenyl)zirconiumdichloride,

A-bis(2-methyl-4,6-diisopropyl-indenyl)zirconiumdichloride,

A-bis(2-methyl-4,5-diisopropyl-indenyl)zirconiumdichloride,

A-bis(2,4,6-trimethyl-indenyl)zirconiumdichloride,

A-bis(2,5,6-trimethyl-indenyl)zirconiumdichloride,
A-bis(2,4,7-trimethyl-indenyl)zirconiumdichloride,
A-bis(2-methyl-5-isobutyl-indenyl)zirconiumdichloride,
A-bis(2-methyl-5-t-butyl-indenyl)zirconiumdichloride,
A-bis(2-methyl-4-(tert-butyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-methyl-4-(4-methyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-methyl-4-(4-ethyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-methyl-4-(4-trifluoromethyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-methyl-4-(4-methoxy-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-ethyl-4-(4-tert-butyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-ethyl-4-(4-methyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-ethyl-4-(4-ethyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-ethyl-4-(4-trifluoromethyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-ethyl-4-(4-methoxy-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-methyl-4-(4-tert-butyl-phenyl)-indenyl)zirconiumdimethyl,
A-bis(2-methyl-4-(4-methyl-phenyl)-indenyl)zirconiumdimethyl,
A-bis(2-methyl-4-(4-ethyl-phenyl)-indenyl)zirconiumdimethyl,
A-bis(2-methyl-4-(4-trifluoromethyl-phenyl)-indenyl)zirconiumdimethyl,
A-bis(2-methyl-4-(4-methoxy-phenyl)-indenyl)zirconiumdimethyl,
A-bis(2-ethyl-4-(4-tert-butyl-phenyl)-indenyl)zirconiumdimethyl,
A-bis(2-ethyl-4-(4-methyl-phenyl)-indenyl)zirconiumdimethyl,
A-bis(2-ethyl-4-(4-ethyl-phenyl)-indenyl)zirconiumdimethyl,
A-bis(2-ethyl-4-(4-trifluoromethyl-phenyl)-indenyl)zirconiumdimethyl,
A-bis(2-ethyl-4-(4-methoxy-phenyl)-indenyl)zirconiumdimethyl,
A-bis(2-isopropyl-4-(tert-butyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-isopropyl-4-(4-methyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-isopropyl-4-(4-ethyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-isopropyl-4-(4-trifluoromethyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-isopropyl-4-(4-methoxy-phenyl)-indenyl)zirconiumdichloride,

A-bis(2-isopropyl-4-(4'-tert[.]-butyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-isopropyl-4-(4'-tert[.]-butyl-phenyl)-indenyl)hafniumdichloride,
A-bis(2-isopropyl-4-(4'-tert[.]-butyl-phenyl)-indenyl)titaniumdichloride,
A-bis(2-isopropyl-4-(4'-methyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-isopropyl-4-(4'-n-propyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-isopropyl-4-(4'-n-butyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-isopropyl-4-(4'-hexyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-isopropyl-4-(4'-sec-butyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-isopropyl-4-phenyl-indenyl)zirconiumdichloride,
A-bis(2-isopropyl-4-(4'-methyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-isopropyl-4-(4'-ethyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-isopropyl-4-(4'-n-propyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-isopropyl-4-(4'-n-butyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-isopropyl-4-(4'-hexyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-isopropyl-4-(4'-pentyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-isopropyl-4-(4'-cyclohexyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-isopropyl-4-(4'-sec-butyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-isopropyl-4-(4'-tert[.]-butyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-ethyl-4-(4'-tert[.]-butyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-methyl-4-(4'-tert[.]-butyl-phenyl)-indenyl)hafniumdichloride,
A-bis(2-methyl-4-(4'-tert[.]-butyl-phenyl)-indenyl)titaniumdichloride,
A-bis(2-methyl-4-(4'-methyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-methyl-4-(4'-n-propyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-methyl-4-(4'-n-butyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-methyl-4-(4'-hexyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-methyl-4-(4'-sec-butyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-ethyl-4-phenyl-indenyl)zirconiumdichloride,
A-bis(2-ethyl-4-(4'-methyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-ethyl-4-(4'-ethyl-phenyl)-indenyl)zirconiumdichloride,

A-bis(2-ethyl-4-(4'-n-propyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-ethyl-4-(4'-n-butyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-ethyl-4-(4'-hexyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-ethyl-4-(4'-pentyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-ethyl-4-(4'-cyclohexyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-ethyl-4-(4'-sec-butyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-ethyl-4-(4'-tert[.]-butyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-n-propyl-4-phenyl-indenyl)zirconiumdichloride,
A-bis(2-n-propyl-4-(4'-methyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-n-propyl-4-(4'-ethyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-n-propyl-4-(4'-iso-propyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-n-propyl-4-(4'-n-butyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-n-propyl-4-(4'-hexyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-n-propyl-4-(4'-cyclohexyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-n-propyl-4-(4'-sec-butyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-n-propyl-4-(4'-tert[.]-butyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-n-butyl-4-phenyl-indenyl)zirconiumdichloride,
A-bis(2-n-butyl-4-(4'-methyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-n-butyl-4-(4'-ethyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-n-butyl-4-(4'-n-propyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-n-butyl-4-(4'-iso-propyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-n-butyl-4-(4'-n-butyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-n-butyl-4-(4'-hexyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-n-butyl-4-(4'-cyclohexyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-n-butyl-4-(4'-sec-butyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-n-butyl-4-(4'-tert[.]-butyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-hexyl-4-phenyl-indenyl)zirconiumdichloride,
A-bis(2-hexyl-4-(4'-methyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-hexyl-4-(4'-ethyl-phenyl)-indenyl)zirconiumdichloride,

A-bis(2-hexyl-4-(4'-n-propyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-hexyl-4-(4'-iso-propyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-hexyl-4-(4'-n-butyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-hexyl-4-(4'-n-hexyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-hexyl-4-(4'-cyclohexyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-hexyl-4-(4'-sec-butyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-hexyl-4-(4'-tert[[.]]-butyl-phenyl)-indenyl)zirconiumdichloride,
A-bis(2-methyl-4-(4'-tert[[.]]-butyl-phenyl)-indenyl)zirconiumbis(dimethylamine),
A-bis(2-ethyl-4-(4'-tert[[.]]-butyl-phenyl)-indenyl)zirconiumdibenzyl,
A-bis(2-methyl-4-(4'-tert[[.]]-butyl-phenyl)-indenyl)zirconiumdimethyl,
A-(2-methyl-4-azapentalene)(2-methyl-4-(4'-methyl-phenyl)-indenyl) zirconiumdichloride,
A-(2-methyl-5-azapentalene)(2-methyl-4-(4'-methyl-phenyl)-indenyl) zirconiumdichloride,
A-(2-methyl-6-azapentalene)(2-methyl-4-(4'-methyl-phenyl)-indenyl) zirconiumdichloride,
A-(2-methyl-4-azapentalene)(2-methyl-4-(4'-ethyl-phenyl)-indenyl) zirconiumdichloride,
A-(2-methyl-4-thiapentalene)(2-methyl-4-(4'-n-propyl-phenyl)-indenyl)-zirconiumdichloride,
A-(2-methyl-4-azapentalene)(2-methyl-4-(4'-isopropyl-phenyl)-indenyl)-zirconiumdichloride,
A-(2-methyl-6-azapentalene)(2-methyl-4-(4'-isopropyl-phenyl)-indenyl)-zirconiumdichloride,
A-(2,5-dimethyl-6-thiapentalene)(2-methyl-4-(4'-isopropyl-phenyl)-indenyl)-
zirconiumdichloride,
A-(2-methyl-6-oxapentalen)(2-methyl-4-(4'-isopropyl-phenyl)-indenyl) zirconiumdichloride,
A-(2-methyl-6-azapentalene)(2-methyl-4-(4'-n-butyl-phenyl)-indenyl)- zirconiumdichloride,
A-(2-methyl-5-thiapentalene)(2-methyl-4-(4'-n-butyl-phenyl)-indenyl) zirconiumdichloride,
A-(2-methyl-4-oxapentalene)(2-methyl-4-(4'-n-butyl-phenyl)-indenyl) zirconiumdichloride,
A-(2-methyl-4-thiapentalene)(2-methyl-4-(4'-s-butyl-phenyl)-indenyl) zirconiumdichloride,
A-(2-methyl-4-oxapentalene)(2-methyl-4-(4'-s-butyl-phenyl)-indenyl) zirconiumdichloride,
A-(2-methyl-4-azapentalene)(2-methyl-4-(4'-tert-butyl-phenyl)-indenyl)- zirconiumdichloride,
A-(2-methyl-6-azapentalene)(2-methyl-4-(4'-tert-butyl-phenyl)-indenyl)- zirconiumdichloride,
A-(2-methyl-4-azapentalene)(2-methyl-4-(4'-n-pentyl-phenyl)-indenyl)- zirconiumdichloride,

A-(2-methyl-N-phenyl-6-azapentalene)(2-methyl-4-(4'-n-pentyl-phenyl)-indenyl)-zirconiumdichloride,
A-(2-methyl-4-oxapentalene)(2-methyl-4-(4'-n-pentyl-phenyl)-indenyl)-zirconiumdichloride,
A-(2-methyl-4-azapentalene)(2-methyl-4-(4'-n-hexyl-phenyl)-indenyl)-zirconiumdichloride,
A-(2-methyl-4-thiapentalene)(2-methyl-4-(4'-n-hexyl-phenyl)-indenyl)-zirconiumdichloride,
A-(2-methyl-6-thiapentalene)(2-methyl-4-(4'-n-hexyl-phenyl)-indenyl)-zirconiumdichloride,
A-(2,5-dimethyl-4-thiapentalene)(2-methyl-4-(4'-n-hexyl-phenyl)-indenyl)-zirconiumdichloride,
A-(2,5-dimethyl-6-thiapentalene)(2-methyl-4-(4'-n-hexyl-phenyl)-indenyl)-zirconiumdichloride,
A-(2,5-dimethyl-6-thiapentalene)(2-methyl-4-(4'-cyclohexyl-phenyl)-indenyl)-zirconiumdichloride,
A-(2-methyl-4-azapentalene)(2-methyl-4-(4'-trimethylsilyl-phenyl)-indenyl)-zirconiumdichloride,
A-(2-methyl-4-thiapentalene)(2-methyl-4-(4'-trimethylsilyl-phenyl)-indenyl)-zirconiumdichloride,
A-(2-methyl-5-thiapentalene)(2-methyl-4-(4'-trimethylsilyl-phenyl)-indenyl)-zirconiumdichloride,
A-(2-methyl-6-thiapentalene)(2-methyl-4-(4'-trimethylsilyl-phenyl)-indenyl)-zirconiumdichloride,
A-(2,5-dimethyl-4-azapentalene)(2-methyl-4-(4'-adamantyl-phenyl)-indenyl)-zirconiumdichloride,
A-(2-methyl-4-thiapentalene)(2-methyl-4-(4'-adamantyl-phenyl)-indenyl)-zirconiumdichloride,
A-(2-methyl-6-thiapentalene)(2-methyl-4-(4'-adamantyl-phenyl)-indenyl)-zirconiumdichloride,
A-(2,5-dimethyl-4-thiapentalene)(2-methyl-4-(4'-adamantyl-phenyl)-indenyl)-zirconiumdichloride,
A-(2-methyl-4-azapentalene)(2-methyl-4-(4'-tris(trifluoromethyl)methyl-phenyl)-indenyl)-zirconiumdichloride,

A-(2,5-dimethyl-4-azapentalene)(2-methyl-4-(4'-tris(trifluoromethyl)methyl-phenyl)-indenyl)zirconiumdichloride,
A-(2-methyl-4-thiapentalene)(2-methyl-4-(4'-tris(trifluoromethyl)methyl-phenyl)-indenyl)zirconiumdichloride,
A-(2-methyl-6-thiapentalene)(2-methyl-4-(4'-tris(trifluoromethyl)methyl-phenyl)-indenyl)zirconiumdichloride,
A-(2-methyl-4-azapentalene)(2-ethyl-4-(4'-tert-butyl-phenyl)-indenyl)- zirconiumdichloride,
A-(2-methyl-5-azapentalene)(2-n-butyl-4-(4'-tert-butyl-phenyl)-indenyl)- zirconiumdichloride,
A-(2-methyl-N-phenyl-6-azapentalene)(2-methyl-4-(4'-tert-butyl-phenyl)-indenyl)-zirconiumdichloride,
A-(2-methyl-4-azapentalene)(2-methylindenyl) zirconiumdichloride,
A-(2-methyl-N-phenyl-4-azapentalene)(2-methylindenyl) zirconiumdichloride,
A-(2-methyl-4-thiapentalene)(2-methylindenyl)zirconiumdichloride,
A-(2-methyl-5-thiapentalene)(2-methylindenyl)zirconiumdichloride,
A-(2-methyl-6-thiapentalene)(2-methylindenyl)zirconiumdichloride,
A-(2-methyl-4-azapentalene)(indenyl) zirconiumdichloride,
A-(2-methyl-5-azapentalene)(indenyl) zirconiumdichloride,
A-(2-methyl-6-azapentalene)(indenyl) zirconiumdichloride,
A-(2-methyl-N-phenyl-4-azapentalene)(indenyl) zirconiumdichloride,
A-(2-methyl-N-phenyl-5-azapentalene)(indenyl) zirconiumdichloride,
A-(2-methyl-N-phenyl-6-azapentalene)(indenyl) zirconiumdichloride,
A-(2,5-dimethyl-N-phenyl-6-azapentalene)(indenyl) zirconiumdichloride,
A-(2-methyl-4-thiapentalene)(indenyl)zirconiumdichloride,
A-(2-methyl-5-thiapentalene)(indenyl)zirconiumdichloride,
A-(2-methyl-6-thiapentalene)(indenyl)zirconiumdichloride,
A-(2,5-dimethyl-4-thiapentalene)(indenyl) zirconiumdichloride,
A-(2-methyl-4-azapentalene)(2-methyl-4-phenyl-indenyl) zirconiumdichloride,
A-(2-methyl-5-azapentalene)(2-methyl-4-phenyl-indenyl) zirconiumdichloride,
A-(2-methyl-6-azapentalene)(2-methyl-4-phenyl-indenyl) zirconiumdichloride,

A-(2-methyl-N-phenyl-4-azapentalene)(2-methyl-4-phenyl-indenyl) zirconiumdichloride,
A-(2-methyl-N-phenyl-5-azapentalene)(2-methyl-4-phenyl-indenyl) zirconiumdichloride,
A-(2-methyl-4-thiapentalene)(2-methyl-4-phenyl-indenyl)zirconiumdichloride,
A-(2-methyl-5-thiapentalene)(2-methyl-4-phenyl-indenyl)zirconiumdichloride,
A-(2-methyl-6-thiapentalene)(2-methyl-4-phenyl-indenyl)zirconiumdichloride,
A-(2-methyl-4-oxapentalene)(2-methyl-4-phenyl-indenyl)zirconiumdichloride,
A-(2-methyl-4-azapentalene)(2-methyl-4,5-benzo-indenyl) zirconiumdichloride,
A-(2-methyl-N-phenyl-4-azapentalene)(2-methyl-4,5-benzo-indenyl) zirconiumdichloride,
A-(2-methyl-N-phenyl-5-azapentalene)(2-methyl-4,5-benzo-indenyl) zirconiumdichloride,
A-(2-methyl-N-phenyl-6-azapentalene)(2-methyl-4,5-benzo-indenyl) zirconiumdichloride,
A-(2-methyl-4-thiapentalene)(2-methyl-4,5-benzo-indenyl)zirconiumdichloride,
A-(2-methyl-5-thiapentalene)(2-methyl-4,5-benzo-indenyl)zirconiumdichloride,
A-(2-methyl-6-thiapentalene)(2-methyl-4,5-benzo-indenyl)zirconiumdichloride,
A-(2-methyl-4-oxapentalene)(2-methyl-4,5-benzo-indenyl)zirconiumdichloride,
A-(2-methyl-5-oxapentalene)(2-methyl-4,5-benzo-indenyl)zirconiumdichloride,
A-(2-methyl-6-oxapentalene)(2-methyl-4,5-benzo-indenyl)zirconiumdichloride,
A-bis(2-methyl-4-azapentalene)zirconiumdichloride,
A-bis(2-methyl-N-phenyl-4-azapentalene) zirconiumdichloride,
A-bis(2-methyl-4-thiapentalene)zirconiumdichloride[.] ,

wherein

A is selected from the group consisting of structural isomers of Dipropylsilanediyl, Dibutylsilanediyl, Dipentylsilanediyl, Dihexylsilanediyl, Diheptylsilanediyl, Dioctylsilanediyl, Dinonylsilanediyl, Didecylsilanediyl, Diundecylsilanediyl, Didodecylsilanediyl, Di(cyclopentyl)silanediyl, Cyclohexyl(methyl)silanediyl, Dipropylgermanediyl, Dibutylgermanediyl, Dipentylgermanediyl, Dihexylgermanediyl, Diheptylgermanediyl, Dioctylgermanediyl, Dinonylgermanediyl, Didecylgermanediyl, Diundecylgermanediyl or Didodecylgermanediyl, Hexyl(methyl)germanediyl, Butyl(methyl)silanediyl,

Butyl(ethyl)silanediyl, Butyl(propyl)silanediyl, Pentyl(methyl)silanediyl, Pentyl(ethyl)silanediyl, Pentyl(propyl)silanediyl, Hexyl(methyl)silanediyl, Hexyl(ethyl)silanediyl and Hexyl(propyl)silanediyl.

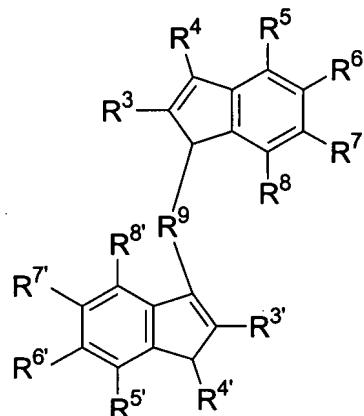
28. (Original) The composition of Claim 27 where the units A are:

Di-n-propylsilanediyl, Di-n-butylsilanediyl, Di-n-pentylsilanediyl, Di(cyclopentyl)ilanediyl, Di-n-hexylsilanediyl, Cyclohexyl(methyl)silanediyl, (n-butyl)(methyl)silanediyl or (n-hexyl)(methyl)silanediyl.

29. (Canceled)

30. (Previously presented) A process for the production of a mixture of racemic and meso isomers of metallocene compounds comprising the steps of:

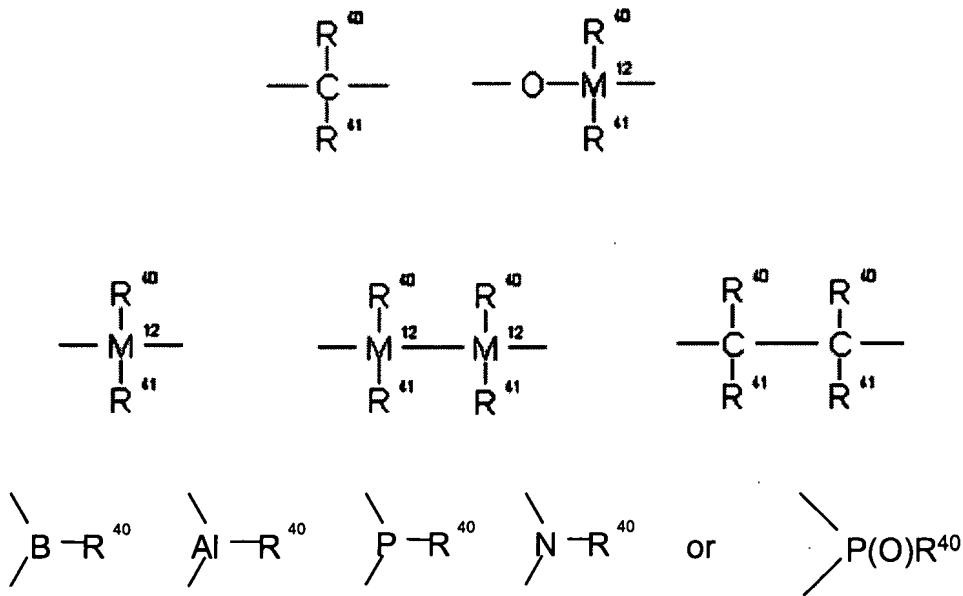
- a) providing a ligand system of the formula



(formula LS)

wherein

R⁹ is a bridge having one of the structures:



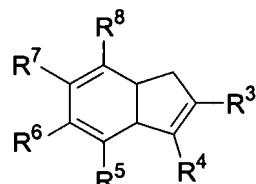
where R^{40} and R^{41} , are identical or different, with or without heteroatoms, when R^{40} and R^{41} are identical they are selected from the group consisting of an alkyl group having from 2 to about 30 carbon atoms, a fluoroalkyl group of from 2 to about 10 carbon atoms, an alkoxy group of from 2 to about 10 carbon atoms, an aryloxy group of from 6 to about 10 carbon atoms, an alkenyl group of from about 3 to about 10 carbon atoms, an arylalkyl group of from 7 to about 40 carbon atoms, an alkylaryl group of from 7 to about 40 carbon atoms, a substituted or unsubstituted alkylsilyl or arylsilyl group and an arylalkenyl group of from 8 to about 40 carbon atoms, when R^{40} and R^{41} are different one of either R^{40} and R^{41} is selected from the group consisting of an alkyl group having from 4 to about 40 carbon atoms, a fluoroalkyl group of from 2 to about 10 carbon atoms, an alkoxy group of from 2 to about 10 carbon atoms, an aryloxy group of from 6 to about 10 carbon atoms, an alkenyl group of from 3 to about 10 carbon atoms, an arylalkyl group of from 7 to about 40 carbon atoms, a substituted or unsubstituted alkylsilyl or arylsilyl group and an arylalkenyl group of from 8 to about 40 carbon atoms, and the other of R^{40} and R^{41} is selected from the group consisting of an alkyl group having from 1 to 40 carbon atoms, a fluoroalkyl group of from 2 to about 10 carbon atoms, an alkoxy group of from 2 to about 10 carbon atoms an aryloxy group of

from 6 to about 10 carbon atoms, an alkenyl group of from 3 to about 10 carbon atoms, an arylalkyl group of from 7 to about 40 carbon atoms, an alkylaryl group of from 7 to about 40 carbon atoms, a substituted or unsubstituted alkylsilyl or arylsilyl group and an arylalkenyl group of from 8 to about 40 carbon atoms,

M^{12} is silicon, germanium or tin, and

$R^3, R^4, R^5, R^6, R^7, R^8$ and also $R^{3'}, R^{4'}, R^{5'}, R^{6'}, R^{7'}$ and $R^{8'}$ are identical or different and are each a hydrogen atom, or a linear, cyclic or branched group, with or without heteroatoms, selected from the group consisting of an alkyl group of from 1 to about 10 carbon atoms, an alkenyl group of from 2 to about 10 carbon atoms, an aryl group of from 6 to about 20 carbon atoms, an arylalkyl group of from 7 to about 40 carbon atoms, an alkylaryl group of from 7 to about 40 carbon atoms or an arylalkenyl group of from 8 to about 40 carbon atoms, a substituted or unsubstituted alkylsilyl or arylsilyl group, with the proviso that R^3 and $R^{3'}$ are not hydrogen, or wherein two adjacent radicals R^5, R^6 or $R^{5'}, R^{6'}$, or R^6, R^7 or $R^{6'}, R^{7'}$, or R^7, R^8 or $R^{7'}, R^{8'}$ can form one or more hydrocarbon ring system(s),

wherein said ligand system is produced by deprotonation of a compound of the formula



(formula 2)

with a base in an inert solvent at temperatures of -70 °C to 80 °C; and,

b) combining said ligand system of formula LS with a compound having the formula M^1X_4 at a temperature of from about -70°C to about 80°C, wherein M^1 is zirconium, titanium or hafnium and X is a halogen, to provide a metallocene compound(s) having a weight ratio of racemic to meso isomers of greater than 5:1 as synthesized.

31. (Original) The process of Claim 30 wherein the weight ratio of racemic to meso

isomers is greater than 10:1 without any further separation of racemic from meso isomers.

32. (Original) The process of Claim 30 wherein the weight ratio of racemic to meso isomers is greater than 15:1 without any further separation of racemic from meso isomers.

33. (Original) The process of Claim 30 wherein the weight ratio of racemic to meso isomers is greater than 20:1 without any further separation of racemic isomers from meso isomers.

34. (Previously presented) A catalyst composition comprising:

a) mixed isomers of at least one metallocene compound having the formula 1a:

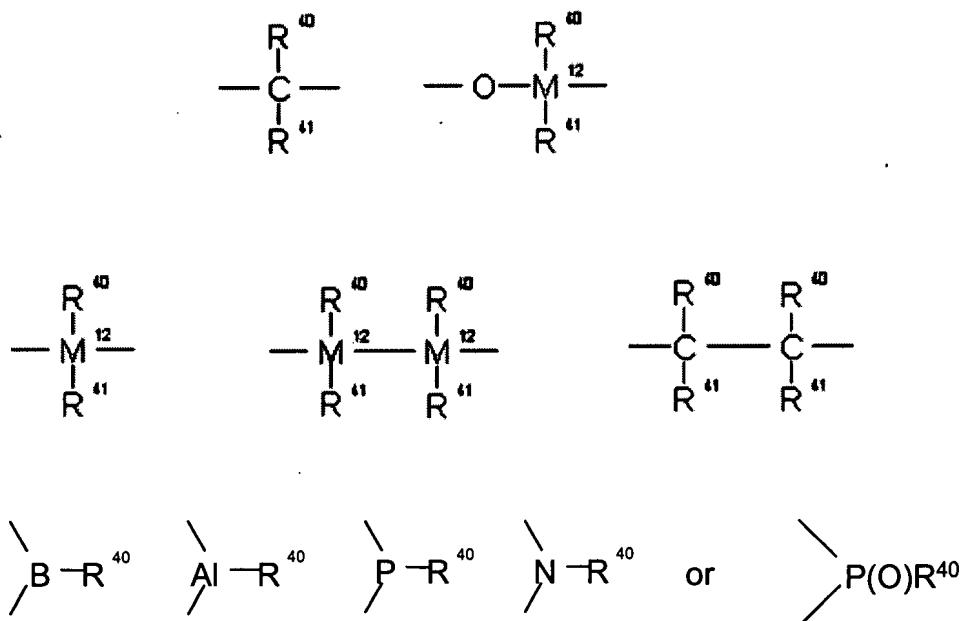


where L¹ and L² are identical or different ligands and are each a substituted mononuclear or polynuclear hydrocarbon radical selected from the group consisting of substituted cyclopentadienyl, indenyl, tetrahydroindenyl, azurenyl, fluorenyl, azapentalenyl, thiapentalenyl or oxapentalenyl, which form a sandwich structure with atom M¹, therebetween,

R¹ and R² are identical or different and are each a hydrogen atom, an alkyl group of from 1 to about 10 carbon atoms, an alkoxy group of from 1 to about 10 carbon atoms, an aryl group of from 6 to about 20 carbon atoms, an aryloxy group of from about 6 to about 10 carbon atoms, an alkenyl group of from 2 to about 10 carbon atoms, an OH group, a halogen atom, or a NR₂³² group, where R³² is an alkyl group of from 1 to about 10 carbon atoms or an aryl group of from 6 to about 14 carbon atoms, or R¹ and R² form one or more ring system(s),

M¹ is a metal of group IVb of the Periodic Table of the Elements,

R⁹ is a bridge between the ligands L¹ and L² having one of the structures:



where R^{40} and R^{41} , are identical or different, with or without heteroatoms, when R^{40} and R^{41} are identical they are selected from the group consisting of an alkyl group having from 2 to about 30 carbon atoms, a fluoroalkyl group of from 2 to about 10 carbon atoms, an alkoxy group of from 2 to about 10 carbon atoms, an aryloxy group of from 6 to about 10 carbon atoms, an alkenyl group of from about 3 to about 10 carbon atoms, an arylalkyl group of from 7 to about 40 carbon atoms, an alkylaryl group of from 7 to about 40 carbon atoms, a substituted or unsubstituted alkylsilyl or arylsilyl group and an arylalkenyl group of from 8 to about 40 carbon atoms, when R^{40} and R^{41} are different one of either R^{40} and R^{41} is selected from the group consisting of an alkyl group having from 4 to about 40 carbon atoms, a fluoroalkyl group of from 2 to about 10 carbon atoms, an alkoxy group of from 2 to about 10 carbon atoms, an aryloxy group of from 6 to about 10 carbon atoms, an alkenyl group of from 3 to about 10 carbon atoms, an arylalkyl group of from 7 to about 40 carbon atoms, a substituted or unsubstituted alkylsilyl or arylsilyl group and an arylalkenyl group of from 8 to about 40 carbon atoms, and the other of R^{40} and R^{41} is selected from the group consisting of an alkyl group having from 1 to 40 carbon atoms, a fluoroalkyl group of from 2 to about 10 carbon atoms, an alkoxy group of from 2 to about 10 carbon atoms an aryloxy group of

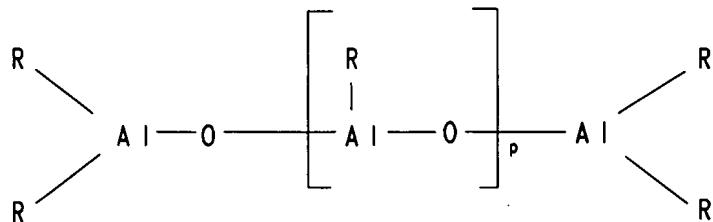
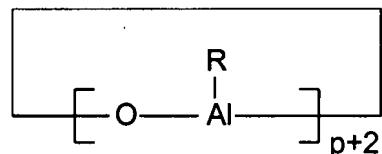
from 6 to about 10 carbon atoms, an alkenyl group of from 3 to about 10 carbon atoms, an arylalkyl group of from 7 to about 40 carbon atoms, an alkylaryl group of from 7 to about 40 carbon atoms, a substituted or unsubstituted alkylsilyl or arylsilyl group and an arylalkenyl group of from 8 to about 40 carbon atoms,

M^{12} is silicon, germanium or tin, and

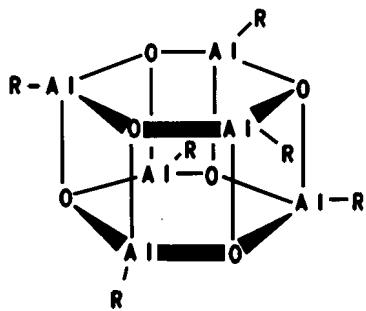
wherein the compound as synthesized has a ratio of racemic or pseudoracemic isomers to meso or pseudomeso isomers of greater than 5:1;

- b) at least one cocatalyst; and
- c) at least one porous support.

35. (Original) The catalyst composition of Claim 34 wherein the cocatalyst is an aluminoxane having one of the following formulas



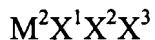
or,



wherein R is hydrogen, an alkyl group of from 1 to about 6 carbon atoms, an aryl group of from 6 to about 18 carbon atoms, or benzyl, and p is an integer from 2 to 50.

36. (Original) The catalyst composition system of Claim 35 wherein the atomic ratio of aluminum from the aluminoxane to the metal M¹ of the metallocene ranges from about 10:1 to about 1000:1.

37. (Original) The catalyst composition of Claim 34 wherein the cocatalyst is a Lewis acid having the formula



wherein M² is selected from boron, aluminum or gallium, and

X¹, X² and X³ are the same or different and are each individually hydrogen, an alkyl group of from 1 to about 20 carbon atoms, an aryl group of from 6 to about 15 carbon atoms, or an alkaryl, aralkyl, halo-alkyl or haloaryl group having 1 to about 10 carbon atoms in the alkyl radical and from 6 to about 20 carbon atoms in the aryl radical, wherein the halogen component can be fluorine, chlorine, bromine or iodine.

38. (Currently amended) The catalyst composition of Claim 34 wherein the Lewis acid is selected from the group consisting of trimethylaluminium, triethylaluminium, triisobutylaluminium, tributylaluminium, trifluoroborane, triphenylborane, tris(4-fluorophenyl)borane, tris(3,5-difluorophenyl)borane, tris(4-fluoromethylphenyl)borane, tris(2,4,6-trifluorophenyl)borane, tris(penta-fluorophenyl pentafluorophenyl)borane,

tris(tolyl)borane tritolyborane, tris(3,5-dimethyl-phenyl)borane, tris(3,5-difluorophenyl)borane and tris (3,4,5-trifluorophenyl)borane.

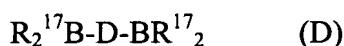
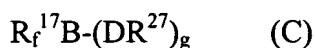
39. (Original) The catalyst composition of Claim 34 wherein the cocatalyst is an ionic compound containing a non-coordinating anion selected from the group consisting of tetrakis (pentafluorophenyl) borate, tetraphenylborate, SbF_6^- , CF_3SO_3^- and ClO_4^- .

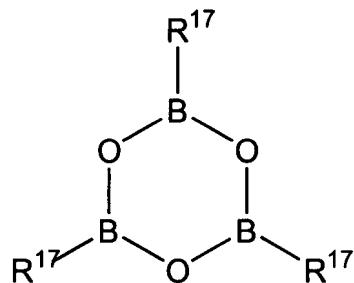
40. (Original) The catalyst composition of Claim 34 wherein the porous support is selected from the group consisting of inorganic oxides, inorganic salts, and polymer powders.

41. (Currently amended) The catalyst composition of Claim 34 wherein the porous support is selected from the group consisting of silica, alumina, aluminosilicates, zeolites, MgO , ZrO_2 , TiO_2 , B_2O_3 , CaO , ZnO , ThO_2 , Na_2O , K_2O , Li_2O , Na_2CO_3 , K_2CO_3 , CaCO_3 , MgCl_2 , Na_2SO_4 , $\text{Al}_2(\text{SO}_4)_3$ $\text{Al}_2(\text{SO}_4)_3$, BaSO_4 , KNO_3 , $\text{Mg}(\text{NO}_3)_2$; $\text{Al}(\text{NO}_3)_3$ $\text{Al}(\text{NO}_3)_3$ and combinations thereof.

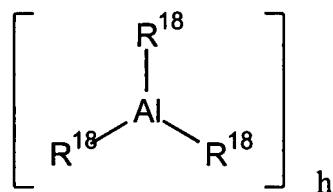
42. (Currently amended) The catalyst system of Claim 34 wherein the porous support is selected from the group consisting of polyethylene, polypropylene, polybutene, polystyrene, divinylbenzene crosslinked polystyrene, polyvinyl chloride, acrylonitrile-butadiene-styrene copolymer, polyamide, polymethacrylate, polycarbonate, polyester, polyacetal or and polyvinyl alcohol.

43. (Currently amended) The catalyst composition of Claim 34 wherein the cocatalyst is a reaction product of at least one compound of formulas (C) and/or (D) and/or (E) with at least one compound of formula (F),





(E)



(F)

where

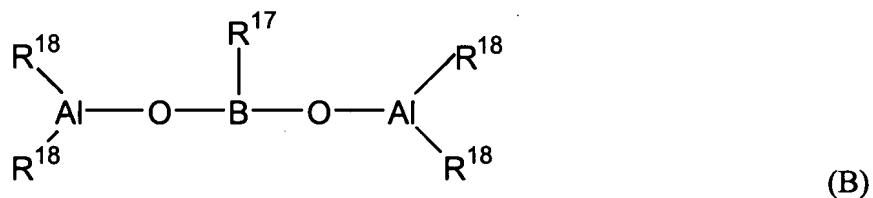
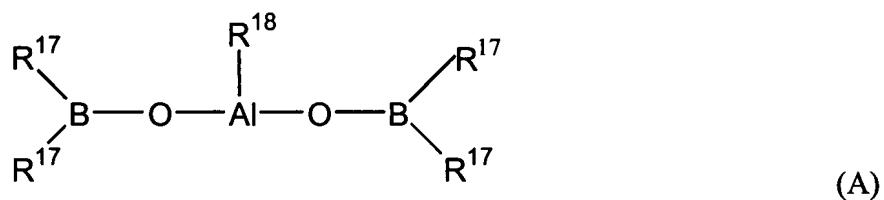
R^{27} is a hydrogen atom or a boron-free C₁-C₄₀ carbon-containing group, selected from an alkyl group of from 1 to about 20 carbon atoms, an aryl group of from 6 to about 20 carbon atoms, an arylalkyl group of from 7 to about 40 carbon atoms or an alkylaryl group of from 7 to about 40 carbon atoms,

R^{17} and R^{18} are the same or different and are a hydrogen atom, a halogen atom, or a C₁-C₄₀ carbon-containing group, selected from an alkyl group of from 1 to about 20 carbon atoms, a haloalkyl group of from 1 to about 20 carbon atoms, an alkoxy group of from 1 to about 10 carbon atoms, an aryl group of from 6 to about 20 carbon atoms, a haloaryl group of from 6 to about 20 carbon atoms, an aryloxy group of from 6 to about 20 carbon atoms, an arylalkyl group of from 7 to about 40 carbon atoms, a haloarylalkyl group of from 7 to about 40 carbon atoms, an alkylaryl group of from 7 to about 40 carbon atoms or a haloalkylaryl group of from 7 to about 40 carbon atoms or R^{17} may also be an $-OSiR^{51}_3$ group, in which the R^{51} groups are the same or different and have the same meaning as R^{17} ; are each a hydrogen atom, a halogen atom, or a C₁-C₄₀ carbon-containing group, selected from an alkyl group of from 1 to about 20 carbon

atoms, a haloalkyl group of from 1 to about 20 carbon atoms, an alkoxy group of from 1 to about 10 carbon atoms, an aryl group of from 6 to about 20 carbon atoms, a haloaryl group of from 6 to about 20 carbon atoms, an aryloxy group of from 6 to about 20 carbon atoms, an arylalkyl group of from 7 to about 40 carbon atoms, a haloarylalkyl group of from 7 to about 40 carbon atoms, an alkylaryl group of from 7 to about 40 carbon atoms or a haloalkylaryl group of from 7 to about 40 carbon atoms,

D is an element of main Group VI of the periodic table of elements or an NR^{61} group, where R^{61} is a hydrogen atom or a $\text{C}_1\text{-}\text{C}_{20}$ hydrocarbon group, selected from an alkyl group of from 1 to about 20 carbon atoms or an aryl group of from 6 to about 20 carbon atoms,
 f is a whole number from 0 to 3,
 g is a whole number from 0 to 3 with $\underline{z+y}$ $\underline{f+g}$ not equal to 0, and
 h is a whole number from 1 to 10.

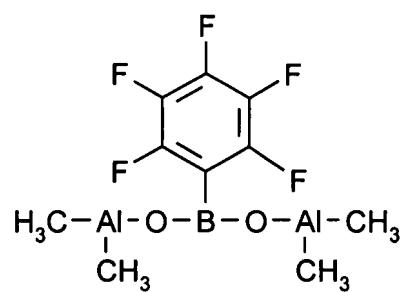
44. (Currently amended) The catalyst composition of Claim 34 wherein the cocatalyst is a compound or a mixture of compounds of formulas (A) and/or (B)

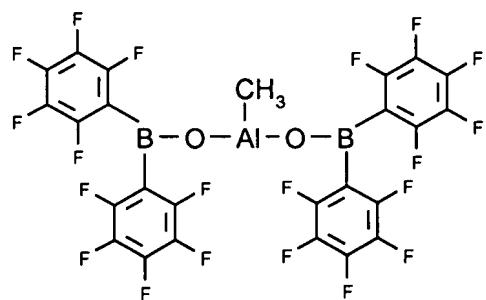
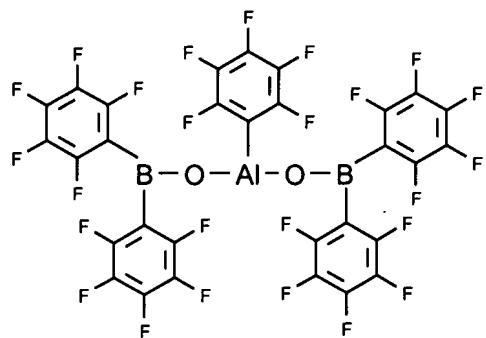
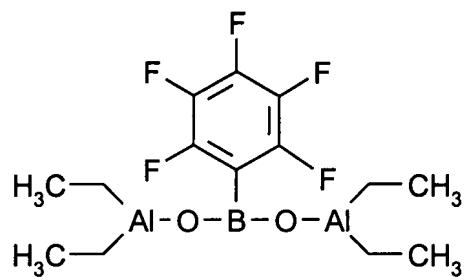
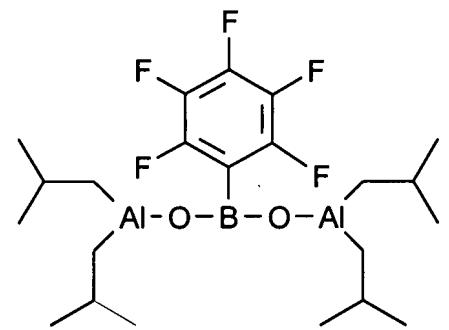


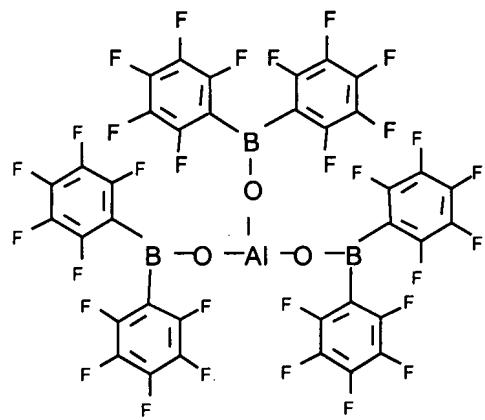
where R^{17} and R^{18} are the same or different and are a hydrogen atom, a halogen atom, a $\text{C}_1\text{-}\text{C}_{40}$

carbon-containing group, selected from an alkyl group of from 1 to about 20 carbon atoms, a haloalkyl group of from 1 to about 20 carbon atoms, an alkoxy group of from 1 to about 10 carbon atoms, an aryl group of from 6 to about 20 carbon atoms, a haloaryl group of from 6 to about 20 carbon atoms, an aryloxy group of from 6 to about 20 carbon atoms, an arylalkyl group of from 7 to about 40 carbon atoms, a haloarylalkyl group of from 7 to about 40 carbon atoms, an alkylaryl group of from 7 to about 40 carbon atoms or a haloalkylaryl group of from 7 to about 40 carbon atoms or R^{17} may also be an $-OSiR^{51}_3$ group, where the R^{51} groups are the same or different and ~~have the same meaning as R^{17}~~ are each a hydrogen atom, a halogen atom, a C_1-C_{40} carbon-containing group, selected from an alkyl group of from 1 to about 20 carbon atoms, a haloalkyl group of from 1 to about 20 carbon atoms, an alkoxy group of from 1 to about 10 carbon atoms, an aryl group of from 6 to about 20 carbon atoms, a haloaryl group of from 6 to about 20 carbon atoms, an aryloxy group of from 6 to about 20 carbon atoms, an arylalkyl group of from 7 to about 40 carbon atoms, a haloarylalkyl group of from 7 to about 40 carbon atoms, an alkylaryl group of from 7 to about 40 carbon atoms or a haloalkylaryl group of from 7 to about 40 carbon atoms.

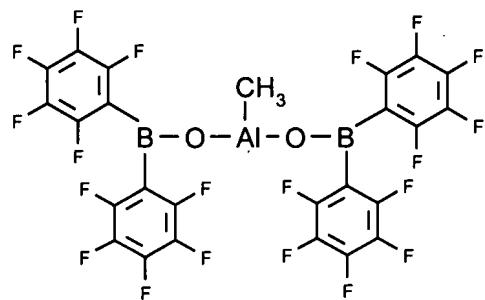
45. (Original) The catalyst composition of Claim 34 wherein the cocatalyst is a compound or a mixture of compounds of the following formulas



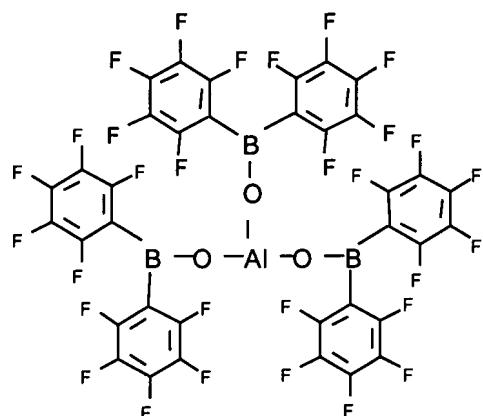




46. (Original) The catalyst composition of Claim 34 wherein the cocatalyst is



47. (Original) The catalyst composition of Claim 34 wherein the cocatalyst is



48. (Original) A process for the polymerization of olefins comprising contacting one or more olefins each having from about 2 to about 20 carbon atoms under polymerization reaction conditions with the catalyst composition of Claim 43.

49. (Original) A process for the polymerization of olefins comprising contacting one or more olefins each having from about 2 to about 20 carbon atoms under polymerization reaction conditions with the catalyst composition of Claim 44.

50. (Original) A process for the polymerization of olefins comprising contacting one or more olefins each having from about 2 to about 20 carbon atoms under polymerization reaction conditions with the catalyst composition of Claim 45.

51. (Original) A process for the polymerization of olefins comprising contacting one or more olefins each having from about 2 to about 20 carbon atoms under polymerization reaction conditions with the catalyst composition of Claim 46.

52. (Original) A process for the polymerization of olefins comprising contacting one or more olefins each having from about 2 to about 20 carbon atoms under polymerization reaction conditions with the catalyst composition of Claim 47.

53. (Original) A process for the polymerization of olefins comprising contacting one or more olefins each having from about 2 to about 20 carbon atoms under polymerization reaction conditions with the catalyst composition of Claim 34.

54. (Original) A process for the polymerization of olefins comprising contacting one or more olefins each having from 2 to about 20 carbon atoms under polymerization reaction conditions with the catalyst composition of Claim 35.

55. (Original) A process for the polymerization of olefins comprising contacting one or more olefins each having from 2 to about 20 carbon atoms under polymerization reaction conditions with the catalyst composition of Claim 36.

56. (Original) A process for the polymerization of olefins comprising contacting one or more olefins each having from 2 to about 20 carbon atoms under polymerization reaction conditions with the catalyst composition of Claim 37.

57. (Original) A process for the polymerization of olefins comprising contacting one or more olefins each having from 2 to about 20 carbon atoms under polymerization reaction conditions with the catalyst composition of Claim 38.

58. (Original) A process for the polymerization of olefins comprising contacting one or more olefins each having from 2 to about 20 carbon atoms under polymerization reaction conditions with the catalyst composition of Claim 39.

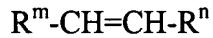
59. (Original) A process for the polymerization of olefins comprising contacting one or more olefins each having from 2 to about 20 carbon atoms under polymerization reaction conditions with the catalyst composition of Claim 40.

60. (Original) A process for the polymerization of olefins comprising contacting one or more olefins each having from 2 to about 20 carbon atoms under polymerization reaction conditions with the catalyst composition of Claim 41.

61. (Original) A process for the polymerization of olefins comprising contacting one or more olefins each having from 2 to about 20 carbon atoms under polymerization reaction conditions with the catalyst composition of Claim 42.

62. (Original) The process of Claim 53 wherein at least one olefin is a 1-olefin.

63. (Original) The process of Claim 53 wherein at least one olefin has the formula



wherein R^m and R^n can be identical or different and are each individually a hydrogen atom or a radical having from 1 to about 20 carbon atoms or R^m and R^n together can form one or more rings.

64. (Original) The process of Claim 53 wherein the olefins include ethylene and one or more 1-olefins having from 4 to about 20 carbon atoms.

65. (Original) The process of Claim 53 wherein the olefins include propylene.

66. (Original) The process of Claim 53 wherein the olefins include propylene and ethylene.

67. (Original) The process of Claim 53 wherein the olefins include propylene and one or more 1-olefins having from 4 to about 20 carbon atoms.

68. (Original) The process of Claim 53 wherein the olefins include propylene, ethylene and one or more 1-olefins having from 4 to about 20 carbon atoms.

69. (Original) A process for the polymerization of olefins comprising:
contacting one or more olefins each having from 2 to about 20 carbon atoms under
polymerization reaction conditions with a catalyst composition including at least one compound
having the formula 1a as set forth in claim 1.

70. (Original) A process for the polymerization of olefins comprising:
contacting one or more olefins each having from 2 to about 20 carbon atoms under
polymerization reaction conditions with a catalyst composition including at least one compound
having the formula 1b as set forth in claim 9.

71. (Original) A process for the polymerization of olefins comprising:
contacting one or more olefins each having from 2 to about 20 carbon atoms under
polymerization reaction conditions with a catalyst composition including at least one compound
having the formula 1c as set forth in claim 15.

72. (Original) A process for the polymerization of olefins comprising:
contacting one or more olefins each having from 2 to about 20 carbon atoms under
polymerization reaction conditions with a catalyst composition including at least one compound
having the formula 1d as set forth in claim 22.